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VAGINAL LITHOTOMY.[1]

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In August last I was requested by Dr. Alexander Jackson, of Plymouth, to operate upon a case of calculus in the female bladder. The patient was sixty-seven years of age, and when I saw her for the first and only time, on the day of the operation, was in bed, appearing much emaciated and pale. She had been suffering greatly with symptoms of cystitis for the better part of a year, and although previously healthy had become a confirmed invalid. There were no symptoms of renal complications. She was the mother of several children. The patient, being etherized, was placed in the position for lithotomy in the male, and a lithotrite was introduced into the bladder for the purpose of determining the size of the stone. The examination showed that it was not a small one, and in view of the degree of inflammation of the bladder and her advanced age I decided to remove it by vaginal lithotomy. The operation was thus performed with the assistance of Drs. Stedman and Jackson. A large bulb-pointed probe was passed into the bladder, and its end made prominent beneath the mucous membrane of the anterior wall of the vagina, at a point just behind the neck of the bladder. An incision was made into the bladder at this point, the knife cutting against the end of the probe. A pair of probe-pointed scissors were introduced into the opening thus made, and the incision was enlarged backwards along the median line to the extent of one inch. The stone was extracted by a pair of polypus forceps. The bladder was then washed out with warm water, and the edges of the wound were brought in contact with six silver wire sutures. A female catheter was retained in the bladder and the patient left in charge of Dr. Jackson, from whom I subsequently learned that she at first did well and no urine passed through the wound. Two weeks after the operation there were symptoms of abdominal inflammation, and some leakage occurred through the wound. Two months later the condition of the patient had improved greatly, and under the application of caustic the slight fistula which still remained had closed, but had reopened at the end of

[1] Read before the Massachusetts Medical Society.

forty-eight hours; Dr. Jackson had no doubt, however, that it would eventually close. Under the date of March 28th, Dr. Jackson writes, "Mrs. R. is about, feeling quite well, with the exception of a little cold recently." The stone [1] contained a nucleus, which was about the size of an almond shell, consisting of oxalate of lime, its surface being coarsely crystalline. The cortical portion which was broken into several fragments during the examination, was phosphatic. The weight of the stone was $214\frac{3}{4}$ grs.

Vaginal lithotomy, or vesico-vaginal lithotomy, as it is sometimes called, is no novelty, although the operation has been much more frequently performed since the treatment of vesico-vaginal fistula has been brought to its present degree of perfection. The employment of sutures to close the incision connecting the bladder with the vagina has placed the operation on an altogether different footing. The first operation was performed by Rousset in the latter part of the sixteenth century, in a case of procidentia and cystocele, in the cul-de-sac of which was found a stone. Fabricius Hildanus removed a calculus through a vesico-vaginal fistula, caused by its presence in the bladder, in 1598. The operation was performed in the last century and also in the early part of the present century, and was almost invariably followed by incontinence of urine resulting from fistula. Faure is, however, reported in 1808 as having avoided a fistula by cutting obliquely through the septum and thus making a valvular opening into the bladder. The first case in which sutures were employed to close the incision occurred, so far as I can discover, in the practice of Dr. Marion Sims. A fistula remained, however, which was subsequently closed by Bozeman. This is probably the operation performed by Sims in 1850. Vallet, of Orléans, employed sutures in two cases in 1856. An interesting historical account of the various operations for stone in the female is given by Hybord.[2] In 1853 Dr. William G. Wheeler,[3] of Chelsea, removed a stone weighing two ounces and three quarters, which had formed about a hair-pin three and one half inches in length through an incision in the septum. Sutures were not used, but the remaining fistula was closed many years afterwards by Dr. R. M. Hodges. Lithotomy was tried in this case without success. A case may be mentioned in this connection, occurring in the practice of M. Panas,[4] who extracted a hair-pin from the bladder by forcing it through the vesico-vaginal septum. The puncture of the septum occurred accidentally during efforts at extraction through the urethra. The pin was drawn into the vagina, straightened, and removed. In four days the patient left the hospital, no trace

[1] Examined by Dr. E. S. Wood.

[2] Des Calculs de la Vessie chez la Femme et les petites Filles. Paul Hybord. Paris. 1872.

[3] American Journal of the Medical Sciences, xxv. 361.

[4] France médicale, February 26, 1876.

of the puncture remaining. Dr. R. M. Hodges performed vesico-vaginal lithotomy some sixteen years since, closing the wound by suture with complete success. Dr. Emmett has performed this operation more frequently than any other surgeon, and it is a curious fact that in nearly all of his cases the calculus had formed after an operation for the cure of vesico-vaginal fistula. In nearly every case the cystitis was sufficiently severe to necessitate leaving the opening unclosed after removal of the stone. In some cases measures were taken to prevent closure of the wound, and when this was not done the wound healed invariably within two weeks. Dr. Emmett[1] has treated a number of cases of chronic cystitis in the female by an incision through the vesico-vaginal septum. The wound was kept open by a hollow glass stud, not unlike a spool in shape. He thinks the operation, if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery. He is satisfied that any one who has the dexterity properly to crush a stone by the female urethra can with much less difficulty close the fistulous opening after lithotomy.

This operation has rapidly increased in favor with many English surgeons. Mr. Aveling[2] was one of the first to call attention to its advantages when followed by suture. He gives a table of thirty-four cases, and adds one operated upon by himself. Twelve of these were performed by English surgeons. In all of them there is but one death recorded. In twelve given by Hybord no death occurred. Aveling believes that although lithotomy ought not to supplant the more simple process of dilatation and crushing, it should be employed when there is the least apprehension of incontinence. James R. Lane, Esq.,[3] operated upon a case in which the stone was nearly two inches in length, dividing the septum to within a short distance of the attachment of the vagina to the cervix uteri. The patient recovered eventually without a fistula, although the edges of a small portion of the wound had to be pared and sewed together subsequently. He thinks there is no part of the vesical parietes which may be incised with so little risk, and that this operation is the safest and best which has yet been devised.

This procedure has not been confined to the adult. A number of cases have been reported where it was performed upon young children. Of these may be mentioned one by Dr. Thomas Smith,[4] the child being but five years of age. The incision was made and the sutures taken without rupturing the hymen. In a second case, in a patient ten years old, he made an incision through the fourchette before cutting through the septum; four sutures were taken in the vaginal wall and three in

[1] Chronic Cystitis in the Female, American Practitioner, February, 1872.
[2] Obstetrical Transactions, 1864, v. 1.
[3] Lancet, January 10, 1863.
[4] Lancet, December 17, 1870.

the perinæum. The patient recovered without incontinence. Dr. S. H. Tewksbury[1] removed a stone the size of a pigeon's egg, through the septum, from the bladder of a girl seven years of age. The vagina was dilated gradually and a small Sims's speculum was introduced, which brought the parts well into view. The sutures were removed on the fourteenth day, when the wound was found united. Dr. Tewksbury's paper contains much valuable information in regard to the history of the operation. He thinks dilatation of the urethra is available in females who have borne children.

The operation has been performed by a number of American surgeons. Indeed, it seems to have been done more frequently in this country than in any other. Through the kindness of Dr. C. H. Mastin, of Mobile, Alabama, I have obtained the following list of surgeons with the number of cases operated on by them : —

J. Marion Sims	1 case.
J. H. Thompson, Washington, D. C.	2 cases.
J. W. Jones, Wilmington, N. C.	1 case.
Jno. T. Hodgen, St. Louis, Mo.	3 cases.
Christopher Johnson, Baltimore	1 case.
Samuel Choppin, New Orleans	1 "
J. M. Keller, Louisville, Ky.	1 "
A. H. Halberstadt, Pottsville, Penn.	2 cases.
Thos. Wood, Ohio	2 "
Thos. A. Emmett, New York	16 "
Paul F. Eve, Nashville	2 "
Charles Bell Gibson, Richmond	1 case.
Greenville Dowell, Galveston	1 "
Ferd. Herff, San Antonio, Texas	1 "
Total	35 cases.

He speaks of six other cases, the names of the operators not being given, making in all forty-one cases.

I have recently obtained the notes of a case performed by Dr. H. O. Marcy, of Cambridge, in April, 1874. The patient since her confinement in February, 1873, had suffered from cystitis. After an attempt at crushing, having first dilated the urethra, and failing through the size and hardness of the calculus, vaginal lithotomy was performed. The incision was made in the median line, commencing about one inch from the urethra, and was continued to include a small portion of the cervix uteri, to allow the extraction of the stone, which weighed over one ounce, and was rough and hard. It was chiefly phosphatic and contained as a nucleus a few fibres of cotton. The wound was brought together with fine silver sutures and united in its entire extent. A minute opening was left, however, at the point of entrance of one wire, which has not closed, although an attempt has since been made to close it.

It will be gathered from the testimony given above that lithotomy is not

[1] Transactions of the Maine Medical Association, 1871.

a difficult operation to perform on the female. This fact appears to have struck forcibly all operators at their first effort, and none more so than myself. The patient being placed in the position for lithotomy, when the labia were separated the anterior wall of the vagina was seen hanging like a curtain at the mouth of the vagina. So superficial was this part that it could be incised and sewed with nearly as much facility as the perinæum. The operation appears to be attended with little or no danger, hardly a single death being reported; on the contrary, in cases where the attending inflammation is severe we find that it not only removes the cause but exerts a curative influence upon the inflammation itself, provided we simply avoid using the suture. The only real danger is from a failure of union of the wound, and this with our present knowledge of the treatment of vesico-vaginal fistula has been reduced to a minimum. Incontinence resulting from this cause is far more easily remedied than that which follows from over-distention and paralysis of the urethra.

A very old method of removing calculi from the female bladder, and one which has been growing greatly in favor of late, is extraction through the dilated urethra. Franco [1] proposed this operation in 1561. Collot combined dilatation with crushing in 1669. This was a favorite method with Sir Astley Cooper, who performed it three times without incontinence resulting. Dr. Yellowly [2] mentions a number of cases where stones of extraordinary size have passed the urethra. In a case which occurred in his own practice the stone weighed over three ounces. In another case the patient, having suffered greatly and after having experienced "an uncommon weight and forcing" on one occasion, brought away, "with a noise which very much surprised the whole company," a stone seven and a half inches in circumference. In all the cases given by him there was permanent incontinence subsequently. This danger of incontinence appears to have been recognized at an early period. Tolet [3] found that if dilatation was excessive, the fibres of the urethra could not contract, and incontinence followed. Brodie [4] says, "I suspect that there is no method of removing it entire from the female bladder without incontinence of urine to a greater or less extent being a consequence of the operation." Vaginal lithotomy with suture was of course not then known. In three out of ten cases mentioned by Hybord there was incontinence subsequently. Mr. Bryant [5] reports two cases of calculus removed by rapid dilatation, which was effected by Weiss's dilator, a steel instrument with three branches, used, I believe, originally by Sir Astley Cooper. In his first case the shortest diameter

[1] Franco, Traité des Hernies, page 140.
[2] Medico-Chirurgical Transactions, vol. vi., 1815.
[3] Traité de la Lithotomie. Paris. 1708.
[4] The works of the late Sir Benjamin Brodie, ii. 649.
[5] Medico-Chirurgical Transactions, vol. xlvii.

of the calculus was one inch, and the age of the patient fifty-two years. In the second case, although the stone was caught in one of its shortest diameters, it measured with the forceps exactly two inches. The patient was thirty-five years old. In both cases was control gained over the bladder for several hours. Mr. Bryant has collected twenty-eight cases, in thirteen of which slow dilatation was employed and in fifteen rapid dilatation. Among the former there were four cases of incontinence; in three of these, however, the stone was very large; among the latter there were none. He much prefers rapid dilatation, and states that "in children calculi one inch in diameter and in adults two inches may be safely removed by these means." Mr. Bryant extracted a lady's stiletto from the bladder, guiding it by the finger introduced through the urethra. No incontinence followed.

Spencer Wells cautions against dilatation. A large stone, he says, may be removed and no incontinence follow, but incontinence might result from the removal of a very small calculus. (In one of Bryant's cases of incontinence the stone was not large.) Incisions into the urethra he thinks more dangerous still, and mentions cases in the practice of a surgeon of large experience where it had been done in two adults and seven children, but "they were all dribblers." He prefers lithotomy. Lane is decidedly of the opinion that dilatation of the urethra should be employed only in the removal of stones of small size, the risk of incontinence being great and the result incurable. The facility of dilatation renders it highly tempting to the surgeon, while the safety and bloodlessness commend it strongly to the patient. The consequence is that it has caused many an unfortunate woman to pass the rest of her days in a loathsome and miserable condition. No stone, he thinks, larger than an acorn should be removed in this way from the adult and none larger than a horse-bean from a child. He condemns strongly all incisions into the urethra.

When a stone is suspected, Christopher Heath [1] does not hesitate to explore the bladder with the forefinger, previously introducing the little finger or dilating with the dressing forceps. He finds in all cases that have undergone this manipulation a split in the mucous membrane under the pubes and some incontinence for twenty-four hours. After this the patient ordinarily recovers complete control over the bladder. In one case a stone three fourths of an inch in diameter was removed from a child, aged eleven years, through the urethra, and subsequently a fragment of a second stone weighing four hundred and eight grains. Incontinence in this case was permanent. For such a case he would recommend vaginal lithotomy. He cautions against the mistake of making the incision too small, the edges of the wound being bruised by a stone too large to pass through easily. He thinks there is no danger

[1] Medical Times and Gazette, April 11, 1874.

of wounding the peritoneum, even if the incision be carried up to the os uteri. In taking sutures both the vaginal and vesical walls should be included. He has operated three times: in two cases the wound healed by first intention; in the third there was a slight fistula. In one of the successful cases the calculus weighed three and one half ounces. The ages of the patients were forty-nine, forty, and fifty years respectively.[1]

During the past year medical writers have had a great deal to say about the treatment of cystitis by dilatation of the urethra. Dr. T. W. Howe[2] reported a case of cystitis cured in this way. This article has brought out a series of communications by Dr. Pridgin Teale, in the Lancet,[3] which are not yet concluded. He and several of his colleagues have employed this treatment for some time past with satisfactory results. This method consists in slowly dilating the urethra by a Weiss's dilator until the fingers can be introduced into the bladder. It is noticeable that in three instances death occurred within a short time after the operation; there was in these cases, however, disease of the kidneys. Two cases suffered from incontinence afterward, and Mr. Teale makes the significant remark, "It does not, however, appear that the liability to permanent incontinence depended upon the degree to which the dilatation was carried." Hewetson[4] and Heath[5] have both written upon the subject. Dr. George Jewett[6] removed a crochet-needle by introducing the index finger into the bladder through the urethra. He noticed a slight rupture at the meatus during his manipulations, but there was no incontinence. The most accurate measurements which have been taken to determine precisely how much the urethra may be dilated without running the risk of incontinence are those made by Professor Simon, of Heidelberg, and published in Volkmann's *Sammlung klinischer Vorträge*,[7] in July last. He recommends smooth, hard rubber plugs of different sizes, by which, when combined with incisions of the orifice of the canal, dilatation may be accomplished without rough handling of the urethra. This limit is two centimetres or .8 inch in width, and 6.3 centimetres or 2.4 inches in circumference. Dilatation to this size permits the index fingers of most surgeons to be passed with ease into the bladder. Simon's finger is small enough to enable him to pass at the same time a very slender instrument. A pair of polypus forceps, such as Mr. Heath uses, would, if introduced at the same time with the finger, as he recommends, stretch beyond this limit. A stone must obviously be a small one to

[1] Transactions of the Pathological Society, vol. xxvi.
[2] New York Medical Record, August 14, 1875.
[3] Lancet, November 27, 1875. Dr. T. B. Curtis, the Journal, December 30, 1875.
[4] Lancet, December 4, 1875.
[5] Lancet, December 11, 1875.
[6] The Journal, January 27, 1876.
[7] Translated in the New York Medical Journal, October, 1875.

be removed by an instrument delicate enough to pass so narrow a space. Hybord puts the limit of dilatation as high as three to four centimetres. Dr. W. W. Lawrence reports in the *Louisville Medical News* a case of stone in a girl five years of age. The urethra was dilated with the fingers, and crushing was combined with extraction. It is not stated whether there was any subsequent incontinence. Dr. D. W. Yandell reports in the same journal a case of bilateral urethral lithotomy in a girl eleven years old. The stone was crushed before removal, and weighed two ounces. There was perfect recovery. In a second case, a girl four years of age, the urethra was divided on a director a short distance behind the meatus, for the extraction of a uric acid calculus the size of a filbert. Incontinence is not mentioned. Dr. Herrgott, in an article in the *Annales de Gynécologie*, January, 1876, gives three cases in which dilatation was practiced for removal of growths from the bladder. An instrument was introduced with the finger, and the operation continued in each case upwards of one hour. The limit given by Simon was not exceeded, and no incontinence followed. In one case the author contemplates removing a remaining portion of the growth through an incision in the vesico-vaginal septum. He mentions several cases where coitus was performed through the urethra. Mention of this fact has also been made by other authors. Incontinence of urine was not present in these cases. Notwithstanding that many successful cases of dilatation with or without crushing have been reported, a high authority in this country expresses himself strongly against this operation. Dr. Emmett, in his work on vesico-vaginal fistula, says, "Comparatively, I do not regard the removal of stone in the female by the urethra as either a safe or a justifiable operation, in consequence of the great risk of incontinence of urine which frequently remains permanent. I have seen at least seven cases in support of this assertion for which no relief could be afforded, and in which I am satisfied that the accident had not resulted from want of skill on the part of the operator."

An interesting clinical lecture by Dr. Hunter McGuire[1] gives the history of a case of vaginal lithotomy in a negress forty years of age. The stone was two and a half inches in diameter. Ten wire sutures were taken and removed on the eighth day, a catheter being retained a few days longer for safe union. Dr. McGuire states that many cases of so-called successful operations by dilatation and extraction have, to his personal knowledge, been followed by incontinence, the term "successful" referring to the extraction of the stone. He says, "We all know how easily a surgeon can introduce his finger into the female bladder when the woman is under the influence of chloroform," "but it certainly is not always safe to do this." In a case at present under his care, a lady

[1] West Virginia Medical Student, May, 1876.

twenty-four years of age had been suffering with chronic cystitis, which resisted the usual remedies, and the physician had introduced his finger through the urethra to explore the bladder. Complete incontinence of urine followed. On examination he found the meatus contracted to probably its original size, but the vesical end of the urethra and mouth of the bladder loose and relaxed, with all sphincter power destroyed. He proposes to make a vesico-urethra-vaginal fistula by removing an elliptical-shaped piece of the septum, and to close it by silver wire sutures in the ordinary manner. He does not believe it is ever necessary to introduce the finger into the female bladder for the sake of diagnosis. A stone over half an inch in diameter should not be removed per urethram. He condemns urethral lithotomy as leading almost invariably to incontinence. Lithotrity, he thinks, is more difficult than in the male. The absence of the prostate gland and of the smooth fixed trigone which we find in the male bladder, the slight prolapse of the posterior wall found in almost all women who have borne children, the sometimes sacculated or perhaps displaced bladder, are some of the more important explanations of this difficulty. Byford is opposed to lithotrity for similar reasons. Dr. Savory, of Lowell, informs me that he has had a case of incurable incontinence following dilatation for the removal of a stone of small size.

Sponge tents have been employed to dilate the urethra for the purpose of removing calculi. They may be useful when the patient dreads anæsthesia, or when the stone is so small as to be voided spontaneously by the bladder on removal of the sponge. This occurred in a case in the practice of Dr. George H. Bixby, of this city, where eleven small calculi came away upon the removal of a sea tangle tent. Dr. H. R. Storer has lately removed a calculus in this way without incontinence subsequently.

Dr. Buchanan,[1] of Glasgow, has performed the operation known as lateral lithotomy on a girl six years old. The operation resembles closely that performed on the male. A rectangular staff being introduced and held under the arch of the pubis, an incision is made into the left nympha, care being taken to avoid opening the vagina on the one hand and cutting too near the tuber ischii on the other. The left forefinger, introduced into the wound, feels with its nail the staff, and the knife guided along the nail is passed through the neck into the bladder. In his case there was some difficulty in retaining the urine at the last account. Dr. Morton operated in this way on six cases, with what is stated to be a favorable result. Mr. Lane believes it to be an excellent operation, and admirably adapted for children. Dr. David Foulis[2] made a dissection of the bladder of a woman on whom this operation had been

[1] Medical Times and Gazette, May 3, 1862.

[2] British Medical Journal, No. 786, page 115.

performed twenty years before, and who died of renal dropsy. A conical opening was found in the left labium minus from which ran a canal opening into the urethra and also into the vagina. The patient had been able to retain her urine, however.

In examining the records of the Massachusetts General Hospital I find from 1821 to 1868 seventy-nine cases of stone reported, of which nine were in females. From 1821 to 1871, a period of fifty years, there were but ten cases of stone in the female. Of these calculi two were extracted through vesico-vaginal fistulæ, one being removed entire, the other being crushed previous to extraction. Five were treated by lithotrity, and in three cases the stone was extracted through the dilated urethra. Of the latter, one was a stone weighing two hundred and eighty grains; the urethra being dilated, it was seized by a pair of forceps and attempts were made to crush it, but without success. It was finally extracted through the urethra. Death occurred two days later, and at the autopsy the urethra was found considerably dilated, and in that portion below and a little to the right of the arch of the pubis was an irregular laceration more than one inch in length, extending into the bladder. It had the appearance of being due to sloughing of the part. The ureters were dilated and the kidneys diseased. In the two cases the urethra was found considerably dilated before the operation. In one a stone three fourths of an inch in diameter was extracted and no incontinence followed. In one case three calculi were extracted, one being the size of a large peach-stone. There was a small fistula in this case, which was subsequently operated upon. The records of many patients operated upon during this period are not to be obtained, they having been treated as out-patients. Dr. C. B. Porter has recently removed a calculus from the female bladder through the dilated urethra. The calculus was partially crushed previous to extraction. Dilatation was not carried beyond Simon's limit. There was no incontinence.

There are several methods of treating stone in the female which have not been discussed in this paper. Lithotrity, for instance, has been scarcely alluded to. My object has been to contrast the operation of vaginal lithotomy with one which has been employed in a class of cases to which that operation is mainly suited, and to discuss the comparative merits of two methods of operating which are now coming into fashion.

Lithotrity is undoubtedly as simple and harmless an operation as any, in the hands of a skillful surgeon, provided its use is limited to a certain range of cases. It was attempted, as has been seen, in several cases where extraction of the stone was subsequently resorted to. I recall one case where this treatment was carried through a long series of sittings. The patient was cured of her stone, which was a very large one, but died, a few months later, of exhaustion. Vaginal lithotomy might have saved her. Large stones have been crushed and removed at one

sitting, in both males and females. The alternative in the male is a capital operation ; in the female, on the other hand, one which has been placed within the domain of minor surgery. We are not, therefore, authorized in females, as we are in males, to take any great risk. I think we may safely say, therefore, that lithotrity should be confined to cases where the stone is neither large nor hard. Dilatation of the urethra combined with lithotrity would enable us, however, to remove a much larger stone at one operation than by lithotrity alone. The dilatation must be done rapidly but gently, and certainly must not exceed the limit given by Simon. (I do not think it is fully proved that we may not have incontinence following dilatation even within this limit, although such an occurrence is not likely.) If the stone be hard, but small enough, it may be extracted whole through the dilated urethra. If, on the other hand, the stone is large and there is much cystitis, or the patient is feeble, or we have reason to suspect trouble in the kidneys, vaginal lithotomy should be the operation. We should be on the safe side in giving this operation the benefit of the doubt when there is any question of choice. The age of the patient is not a contra-indication to the operation, although I believe that it is rarely necessary to perform it upon children, who bear lithotrity well. Vaginal lithotomy, it is hardly necessary to point out, is far preferable to the supra-pubic operation.

In conclusion, we may say that vaginal lithotomy, involving at the worst a danger completely within our control, may be employed in a much wider range of cases than it has been hitherto ; while dilatation of the urethra, entailing, it may be, an infliction which it is beyond our power to remedy, should be practiced with great caution, until we more fully understand the class of cases to which it is suited and have determined with greater certainty the limit to which it can be carried.

RECENT PROGRESS IN PHYSIOLOGY.

BY H. P. BOWDITCH, M. D.

FUNCTIONS OF THE CORTEX CEREBRI.

Investigations by Local Irritation. — In the report for July, 1873, an account was given of the then recent experiments of Hitzig, Ferrier, and others, showing that certain groups of muscles could be brought into activity by the irritation of definite points on the surface of the cerebral lobes. Since that time the subject has occupied the attention of numerous investigators, who all admit the existence of "active spots" (as Burdon-Sanderson calls them) in the cortex cerebri, but differ widely in their views of the mechanism by which the irritation of these spots gives rise to muscular movement. Three possible explanations of the phenomenon may be given : (1.) The movement is caused

by the irritation, not of the part to which the electrodes are applied, but of some deeper-seated portion, in consequence of the spreading of the electric current through the cerebral substance. (2.) The "active spots" are nerve centres, *i. e.*, collections of ganglion cells, presiding over the groups of muscles which are brought into activity by their irritation. (3.) The "active spots" are not themselves nerve centres, but stand in nervous connection with the deeper-seated centres of definite groups of muscles. The movements in question are therefore of a reflex nature.

The first of these propositions has been maintained by Dupuy[1] and by Carville and Duret.[2] These authors, however, only showed that it is possible to irritate remote parts of the brain by electrodes applied on the surface, not that it is impossible to produce muscular movements by an irritation of the cortex under conditions which preclude the possibility of any but local action. That local irritation of the cortex may really produce the movements in question has been shown by Braun[3] in a series of experiments consisting in dividing with a sharp knife the connections between an "active spot" and the subjacent tissues. After this operation, which would not be likely to prevent the spreading of electrical currents to the deeper tissues of the brain, irritation of the "active spot" was found to be without effect even when the intensity of the current was made much greater than that which, before the operation, was sufficient to produce definite movements. A similar investigation made entirely independently by Dr. J. J. Putnam[4] led to the same result, except that after section of the subjacent tissues it was found necessary to increase *only slightly* the intensity of the current applied to the cortex in order to produce the same muscular movements as before. Carville and Duret deny that these experiments prove what their authors intended to show, for they maintain that the blood effused when the tissues under the "active spots" are divided is a so much better conductor of electricity than the brain substance that the currents no longer penetrate into the deeper tissues unless they are made more intense. How far this objection is valid can be determined only by careful investigations directed to this special object. It is proper to mention, however, that Carville and Duret, influenced by other considerations, have admitted in a recent work[5] that electrical irritation of the cortex "has a certain local action, and that the result of this action varies with the points of application of the electrodes."

The observations of Hermann[6] (that destruction of the "active spots" by drying or by nitric or acetic acid does not prevent the irrita-

[1] Examen de quelques Points de la Physiologie du Cerveau. Paris. 1873.
[2] Gazette médicale de Paris, January 10, 1874.
[3] Eckhard's Beiträge zur Anatomie und Physiologie, vii. 127.
[4] The Journal, xci. 49.
[5] Archives de Physiologie, 1875, vii. 409.
[6] Pflüger's Archiv, x. 77.

tion from producing the usual effects, and that after mechanical removal of the "active spots" irritation of the underlying brain substance still calls forth the same movements) do not of course disprove the existence of excitable nerve tissue in the cortex, but only show that the tissue under the "active spots" is also excitable. In view of the above-mentioned positive results obtained by Braun and Putnam the negative results of Hermann's experiments are of little importance.

The excitability of definite spots in the cortex being therefore regarded as well established, it remains to inquire whether the movements in question are due to a direct irritation of *centres in the gray substance* or are reflex phenomena taking place through *deeper-seated centres*, the excitable nerve tissue of the cortex (whether nerve-cells or nerve fibres) acting in this case in the same way as the terminations of peripheric nerves in an ordinary reflex action.

To appreciate the force of arguments bearing upon this point it is necessary for us to consider what information we can obtain from other sources in regard to the mechanism by which the cerebral centres are brought into connection with the motor nerves. The fact that the cervical cord contains fewer nerve fibres than the spinal nerve roots shows that the brain cannot have a direct connection with every muscular fibre, and our inability to innervate an isolated muscular fibre, or even a single muscle (except with difficulty and after much practice), is quite in accordance with this anatomical observation. Moreover, the occurrence of purposive reflex movements in animals whose cervical cord has been divided, and their apparent identity, as far as muscular mechanism is concerned, with voluntary movements, have led to the hypothesis that the cord is the seat of so-called "coördinating centres" presiding over *groups* of muscles, and that these centres may be brought into activity either by an impulse coming from without through an efferent nerve, in which case the movement is reflex, or by an impulse coming from above, for example, from a centre of volition, in which case the movement is voluntary. By an extension of the same hypothesis higher, "coördinating centres" presiding over more complicated muscular movements, for example, those of walking, have been assumed to exist in the ganglionic masses at the base of the brain.[1] It will thus be seen that, while it is very easy to decide whether a movement called forth by the irritation of a nerve trunk is direct or reflex in its character, the decision is much more difficult when the movement is the result of irritation of the cortex cerebri. For in the former case, apart from the help afforded by a knowledge of the anatomical distribution of the nerve, the character of the movement (*i. e.*, whether tetanic purposive, etc.) and the time required for its accomplishment are usually conclusive in regard to the matter. In the latter case, however, not

[1] See Report on Pathology of Cortex Cerebri, in the Journal, xci. 111.

only does anatomy afford us little or no assistance, but, if the above-mentioned theory of nervous mechanism is correct, we cannot expect that a direct will differ materially from a reflex movement, either in character or in the time necessary for its performance. This will be evident when we consider that in both cases the impulse must be transmitted through coördinating centres which bring whole groups of muscles into action, and that it is in these centres that the delay in transmission occurs which is commonly regarded as characteristic of reflex phenomena.

The above considerations are sufficient to invalidate many of the arguments which have been brought forward to prove the reflex nature of the movements in question. Thus it has been urged by Schiff[1] that these movements are reflex because they are stopped by complete narcosis, because no tetanus is produced by a rapidly interrupted induced current, and because the time elapsing between the beginning of the irritation and the production of the movement is from seven to eleven times greater than it should be if the impulse were directly transmitted, with the normal rapidity of nerve force, from the point irritated to the muscles. On the other hand, it has been shown by Gliky[2] that the movements in question cannot, like various well-known reflex actions, be inhibited by a powerful irritation of a peripheric nerve. This writer is therefore inclined to deny to nerve centres all participation in the production of these movements, though he admits that the experiments are not decisive.

In the imperfect state of our knowledge of the conditions affecting the activity of the cerebral centres it is difficult to devise conclusive experiments, but in their absence it is interesting to notice such observations as those of Lander[3] on the brain of an idiotic boy fifteen years of age, who had had an attack of infantile spinal paralysis at three years of age and since that time had suffered from paralysis of the muscles of the trunk and neck, especially on the right side. In this brain a decided atrophy was noticed in those convolutions which, according to the observations of Betz[4] on the ganglion cells of the cortex, are to be regarded as analogous to the motor regions of the gray substance demonstrated in experiments on animals. It was noted also that the atrophy was more marked on the left side than on the right. In this connection are also to be mentioned the observations of Soltmann,[5] who found that irritation of the cortex cerebri of puppies less than nine or ten days old produced no muscular movements, and that the "active spots" on the brains of young animals differ in size and shape from those of adults.

[1] Archiv für experimentale Pathologie, 1874, iii. 171.

[2] Eckhard's Beiträge, vii. 179.

[3] Centralblatt für die medicinischen Wissenschaften, 1875, page 225.

[4] Centralblatt für die medicinischen Wissenschaften, 1874, page 596.

[5] Centralblatt für die medicinischen Wissenschaften, 1875, page 209.

Whatever view, therefore, may be taken of the mechanism by which irritation of the cortex gives rise to muscular movements, it seems evident from these two observations that the "active spots" are regions of the cortex *whose development is connected with the power of causing contraction in certain sets of muscles.*

Not only do groups of striped muscles seem to be thus functionally connected with definite regions of the cortex cerebri, but there is also reason to believe that a similar relation exists for the heart, the blood-vessels, the spleen, the intestines, and the salivary glands. Thus it has been found by Lépine[1] that irritation, with feeble induced currents, of the post-frontal convolution of a curarized dog causes a rise of blood-tension in the crural artery of some seven centimetres of mercury. This is accompanied by an increased rapidity of the heart-beats, but if the irritation is very strong and the vagi intact, a diminution in the rate of the heart-beats results. If the irritation is applied to a spot which on an uncurarized dog would cause movements of one of the opposite feet, the temperature of this foot rises several tenths of a degree. The temperature of the foot on the same side rises also, but to a less degree, while that of the rectum remains stationary. Lépine also discovered certain spots whose irritation caused an increased secretion of saliva. Bochefontaine,[2] operating in a similar way, found four different spots on the surface of the brain whose irritation caused contraction of the spleen, and six spots from which movements of the intestines could be produced.

A much more decided rise of temperature in the limbs than that noticed by Lépine was observed by Eulenberg and Landois[3] as the result of the application of the actual cautery to the cortex on the opposite side. They regarded this result, however, as due to the destruction, not to the irritation of the parts in question, for they were able by electrical irritation of the same parts to obtain a slight and transient diminution of temperature in the limbs. This question will be considered in the second portion of this report.

(To be concluded.)

AN INTRODUCTION TO PATHOLOGY AND MORBID ANATOMY.[4]

THE reader of this book should bear in mind that it is offered as an introduction to the subjects of which it treats. It is not, therefore, to be regarded as containing a complete statement of the points to which it refers, nor indeed

[1] Gazette médicale, 1875, No. 25.

[2] Gazette médicale, 1875, No. 52.

[3] Centralblatt für die medicinischen Wissenschaften, 1876, page 260.

[4] *An Introduction to Pathology and Morbid Anatomy.* By T. HENRY GREEN, M. D. Lond. Second American, from the third revised and enlarged English edition. Illustrated. Philadelphia: Henry C. Lea. 1876.

as giving anything more than the impressions of the writer concerning the matter he chooses to present. At the same time it must be admitted that a judicious selection has been made, and that the more important problems in pathology and pathological anatomy are brought forward in a way which is likely to attract and often to fix the attention. Herein lies the strength and at the same time the weakness of the book. The author's mind is apparently of that character which retains the positive, mainly; doubts are either not admitted or are set aside without allowing the reader to suspect their existence. The style is clear and forcible, the sentences short and pithy, the statements dogmatic and categorical. But little is probable, while certainty is everywhere prominent.

In speaking of post-mortem rigidity it is stated that the more healthy and vigorous the muscles are, the longer is it before rigidity takes place. This statement omits entirely the consideration of those interesting cases of sudden death, as on the battle-field from gunshot wounds, when the position of the body and limbs remains the same as at the moment of death. The obliteration of the ductus arteriosus and umbilical vessels after birth can hardly be regarded as apt examples of atrophy from diminished functional activity. It might be considered much more appropriate that mention of them should rather be made in connection with thrombosis, or the inflammation of vessels.

The distinction between infiltrations and metamorphoses is very sharply drawn, in the former a matter from the blood being deposited in the tissues. With regard to amyloid infiltrations this process is by no means so accurately made out as to be thus absolutely stated. In the description of the mucoid and colloid degenerations, too much stress seems to be laid upon the seat of the change; in the intercellular substance in the former, in the cells in the latter. The corpora amylacea are identified under circumstances with brain sand, the corpora arenacea, at least we find no mention of the latter except in this relation. In the description of the intercellular substance of the sarcomata it is stated that the same may be perfectly fluid and homogeneous. Without some qualification or explanation the reader would be justified in inferring that a fluid rich in cells might be spoken of as a sarcoma.

The physician who likes to know something of what has been done will undoubtedly be interested in this volume. He who wants to learn what there is to do will neither receive the incitement to nor an idea of the necessary training which must first be gone through with.

The book contains numerous wood-cuts, original and borrowed, most of them exceedingly good and very suggestive to those familiar with histological work. The name of the publisher is a sufficient guaranty that the general appearance is a creditable one. R. H. F.

REPORT FOR WORCESTER DISTRICT.[1]

ALBERT WOOD, M. D., REPORTER.

Wesley Davis, M. D., of Worcester, reports two cases of rupture of the bladder: —

Case I. I was called at five A. M., June 29, 1875, to attend a well-developed Irish laborer, thirty years of age, who, while in an intoxicated condition the afternoon before, had fallen over a chair in attempting to dance. He was taken up and carried to his home, where he arrived at 6.30 P. M., not complaining of any particular pain, though he vomited soon, and several times during the night. Upon my arrival I found there were slight abrasions upon the forehead and nose, and no other visible injury. He was very restless, suffering severely from pain in the abdomen, referred especially to the epigastrium, with some nausea. Gave morphine hypodermically, and ordered powders of the same, to be used as needed to control pain. During the forenoon restlessness continued, he could not be induced to remain in bed, and was making frequent efforts to urinate, which he had not done since the injury.

Saw the patient with Dr. Sargent during the afternoon, and upon introducing a catheter, drew off about a pint of bloody urine containing a considerable quantity of clotted blood. Bowels were tender upon pressure; in other respects his condition was similar to the last report. We repeated the morphine hypodermically, and ordered opiates *pro re natâ*.

June 30th. He was much the same, only weaker, and the bowels were more tender and tympanitic; the nausea and inability to urinate continued. Drew a little bloody urine, but made no change in treatment. He died July 1st, rather less than three days from the time of injury.

Autopsy, twenty-four hours after death, in presence of Drs. Sargent and Rice. Abdomen was much distended. Lungs, heart, liver, and kidneys healthy. Membranes of brain slightly congested. The abdominal cavity contained from two to three quarts of bloody fluid. Intestines were distended with flatus, and in many places adherent from the recent peritonitis. The bladder was found ruptured to the extent of two inches antero-posteriorly, extending through the fundus and anteriorly, with clean-cut edges, looking almost as though done with a sharp-cutting instrument, and it had the appearance of having been in a perfectly healthy condition prior to the accident. There were no marks of violence to be detected, either externally or in the parietes of the abdomen.

Case II. A case very similar to the above occurred here a few weeks previously, the particulars of which are obtained from the report of the autopsy and evidence given at the coroner's inquest, the patient having been under the care of an irregular practitioner.

The 11th of May the deceased received an injury, the circumstances connected with which he refused to disclose. There was a severe cut upon the forehead, which was closed by two sutures, and there was also a "black eye." He was soon troubled with nausea and pain in the abdomen, most severe in the hypogastrium and right hypochondrium. There was great restlessness,

[1] Concluded from page 46.

soon followed by sensitiveness upon pressure. He was unable to urinate after the injury, and about a pint of bloody urine was drawn the following day. The tenderness increased, nausea and restlessness continued, tympanites developed, and, failing rapidly, he died on the 14th, three days from the time of injury.

Autopsy, forty hours after death, by Dr. Henry Clarke, Drs. Rice and Wood being present. There was discoloration of the right groin and of the left groin and thigh. The abdomen was much distended, and contained (by estimation) two quarts of bloody fluid and some small clots in the folds of the intestines and omentum, which were quitee xtensively ecchymosed, the former showing some slight recent adhesions. Upon raising the bowels so as to look into the pelvis, a rupture of the bladder at the fundus was disclosed, looking as though a piece two inches in diameter had been cut out, leaving ragged edges. There was also a rent in the peritoneum, extending two inches laterally from the edge of the opening in the fundus. The abdominal parietes over the bladder were bruised and discolored. The neck of the bladder and prostate were in a normal condition, as were also the heart and lungs.

In each of the above cases there were suspicions of foul play, and consequently an inquest was held in each, but without eliciting any facts to warrant the suspicions.

C. A. Peabody, M. D., of Worcester, reports a case of fracture of the skull: —

A man about thirty years of age, while riding home intoxicated, was thrown from his wagon, receiving a bad fracture of the skull. The fracture was nearly over and in the direction of the coronal suture on the right side, and was three inches long by one inch and a half wide, compound and comminuted. The fragments of bone were driven an inch and a half within the cranium, lacerating the membranes and causing the loss of considerable of the brain-substance.

To dress the wound it was necessary to administer ether, but the patient was not fully conscious, and for several days afterwards had mild delirium. The wound was cleaned and its edges brought together with several sutures, a cold compress applied, and cochia pill ordered, to be repeated every four hours if necessary. On the second day quite a quantity of pus and broken-down brain-substance escaped from the wound, and there was beginning paralysis of the left arm. For the next few days delirium became more marked, though not at any time violent, but the patient was very restless and excitable. The face was much swollen, the tongue and teeth were covered with sordes, the pulse was quick and feeble, and the prognosis decidedly unfavorable. The discharge from the wound was healthy pus, considerable in quantity. The patient became more and more restless, refusing to take anything given as medicine, but drank a good deal of milk. Chloral was now administered, in milk, in twenty-grain doses every three hours. Only two doses were necessary to induce sound sleep.

From this time delirium vanished and the patient began to improve; the swelling disappeared from the face, and the appetite and sleep became good.

There had been for several days some protrusion of the brain at the wound, but this was overcome, and perfect union of the wound resulted. When he left the hospital, twenty-four days after admission, there was some paralysis of the opposite arm remaining, but otherwise his recovery seemed to be nearly perfect.

Dr. Peabody also reports a case of subluxation of the atlas: —

A brakeman, while "wooding up" an engine, was seized with vertigo and fell from the woodpile to the ground, a distance of about four feet, striking on his head. He was at once picked up unconscious and removed to the City Hospital.

On admission he was found to be entirely unconscious, and could not be roused, though he moved all his limbs freely; there was some vomiting; the eyes were closed, pupils moderately dilated; pulse and breathing were accelerated; efforts to make him swallow were ineffectual. There was a small scalp wound over the occipital protuberance, but no evident fracture of the skull. At the back of the neck immediately below the skull, from which it was separated by a narrow depression, was a prominence of the size of a filbert. The head was movable in every direction, but when thrown forward most alarming symptoms were produced: the pulse and respiration almost ceased, the face became blanched, and the pupils at once contracted, dilating again, however, with the returning pulse, respiration, and color, when the head was carried back again.

Soon after this manipulation a severe vomiting fit came on, immediately after which the patient opened his eyes, recognized and spoke to a person standing near, and complained that his neck felt sore. The prominence at the back of the neck was now no longer to be found.

The patient soon got up and walked about, and the next morning was discharged, well.

George J. Bull, M. D., of Worcester, reports a case of spina bifida: —

A child was born recently under my care having a spina bifida tumor in the lumbar region, communicating directly with the spinal canal, and having its transparent coverings formed of the spinal meninges. On the second day we punctured the sac, which soon afterward collapsed, and was then lightly compressed. Nervous symptoms followed, and on the third day convulsions. Paralysis of the lower extremities gradually became complete; the bladder and sphincter ani were also paralyzed; the fingers and toes were always rigidly flexed; hydrocephalus slowly manifested itself; thrush appeared as a distressing complication; emaciation steadily progressed, and the child died of asthenia at the age of two months.

While the case went on thus unfavorably, the sac passed through a series of changes, including superficial inflammation and sloughing, in which its coverings became contracted, opaque, and dense, its contents disappeared, and at last we had a hardly noticeable protrusion covered by strong skin in place of the transparent tumor.

In consequence of paralysis of the bladder I had to draw off the urine fre-

quently, using a No. 1 gum-elastic catheter, the child being a female. On the first occasion of its use, at the close of the fourth day, urine had not been passed for over twenty-four hours, the abdomen was tense and prominent, and dull on percussion as high as the umbilicus, and I obtained twenty-two drachms of high-colored, acid urine containing albumen and granular and hyaline casts, together with epithelium from the kidney and bladder, and some mucus. The urine of the fifth day contained albumen, but was not examined for casts. That of the sixth day had less albumen, but under the microscope showed several casts and some granular *débris*. Subsequent examinations gave no evidence of casts; the albumen gradually disappeared until, after the ninth day, none could be discovered. In looking for the cause of the occurrence of these abnormal constituents of the urine the question naturally arises, Are renal casts and albumen usually present in the urine of the first days of infantile life? That they are not so present would appear from the observations of MM. Parrot and Robin, detailed in their paper[1] On the Normal Urine of New-Born Infants, presented to the Académie des Sciences, for they state that under no circumstances does the normal urine of the fœtus or the new-born child contain albumen. During the first two days on which the catheter was used, the urine contained mucus and had a specific gravity of 1015; afterwards the specific gravity was from 1004 to 1008. The urine was always acid, sometimes deposited oxalate of lime and sometimes a gravel of uric acid, in consequence, doubtless, of the wasting of tissue and the very small supply of nourishment the babe was able to take. At the time I was catheterizing this infant I took abdominal palpation and percussion as my guides in determining when to use the instrument; but it is well to know that the new-born infant secretes more urine in proportion than the adult. Parrot and Robin state that "a new-born infant passes four times more urine than an adult per kilogramme of its weight." In this case the amount of liquid ingesta was much less than that ordinarily consumed by healthy infants; it is, therefore, probable that the quantity of urine secreted was less than normal. In the following table I have recorded accurately the number of drachms of urine which entered the bladder in a known number of hours:—

Age of Child.	Time of Day.	Number of Hours.	Drachms of Urine.	Sp. Gr.
4 days.	From 8.30 P. M. to 2 P. M.	17½	16	1015
5 "	" 2 P. M. to 8.30 P. M.	6½	8	1015
6 "	" 8.30 P. M. to 10 A. M.	13½	11	1008
6 "	" 10 A. M. to 5 P. M.	7	12½	1008
6 "	" 5 P. M. to 9 P. M.	4	6	–
9 "	" 5.30 P. M. to 2.30 A. M.	9	15	1008
10 "	" 2.30 A. M. to 11 A. M.	8½	10½	1008
10 "	" 11 A. M. to 6 P. M.	7	12	1007
11 "	" 9.15 A. M. to 6 P. M.	9	18	1007
11 "	" 6 P. M. to 12.30 A. M.	6½	12	–
12 "	" 12.30 A. M. to 9.30 A. M.	9	8½	–
12 "	" 9.30 A. M. to 3.15 P. M.	5¾	8	1008
12 "	" 3.15 P. M. to 9 P. M.	5¾	4	–
13 "	" 9 P. M. to 9 A. M.	12	10	1008
13 "	" 9 A. M. to 3 P. M.	6	6	–
		127	157½	

[1] Gazette hebdomadaire, January 14, and Medical Times and Gazette, January 22, 1876.

This shows an average secretion of one drachm and a quarter per hour, or thirty drachms per day; that is, about three times as large an amount in proportion to the weight of the body as is secreted by the adult. The infant bladder is probably not larger in proportion than that of the adult; therefore when it is paralyzed we should remember the large secretion of urine in the early days of life, and use the catheter more frequently. In this case I used it about four times in the twenty-four hours.

Albert Wood, M. D., reports two cases where quinine was used for after-pains: —

Case I. Mrs. H., aged thirty-two, mother of six children. Had always been a hard-working, ambitious woman. She had been under treatment for some months for retroflexion of the uterus, with a good deal of vesical disturbance. Had had retention of urine several times. She became pregnant, and was more or less uncomfortable most of the time, until the beginning of the seventh month, when she had what appeared to be threatened miscarriage. The uterus would contract every two or three minutes, and she would appear to be in the most intense agony. There was no show and no dilatation of the os. Large doses of chloral and of opium and a variety of other anodynes had no effect whatever to relieve the pain. It was only after putting her thoroughly under ether that the pains were stopped. As soon as she came out of the ether the pains returned, and were again controlled by ether twice. I should have said that, as far as I could judge, her bowels were in a healthy state.

She remained quiet for about ten days, when she had a similar attack. After trying one large dose of chloral, and morphia subcutaneously, I put her immediately under ether, with relief at once. In less than two weeks she had another similar attack under the care of another physician, of large experience. He met with similar success to mine in trying to relieve the pain, and was obliged to resort to ether. At the beginning of the eighth month labor came on, and she was delivered of a living child. The next day she began to have the same excruciating pains as before confinement. I decided to try sulphate of quinine. I gave her ten grains in the morning, with ten grains to be repeated in six hours if needed. The first dose mitigated the pains, which were entirely relieved by the second.

Within a year she again became pregnant, and at the end of the fifth month commenced in the same way as during her previous pregnancy. I gave her twenty grains of quinine, at one dose, without any relief, and was obliged to resort to ether again. After having two of these attacks she was delivered, at the end of the sixth month, of a dead child. The same excruciating after-pains appeared, which were instantly relieved by twenty grains of sulphate of quinine.

Case II. Mrs. C., the mother of eleven living children. The last three labors have been under my care. The first time I attended her she told me that she suffered terribly from after-pains, so I instructed the nurse how to keep the womb well contracted, and gave a very large opiate, which was repeated, and repeated with chloral, with no marked relief, for several days. At the next confinement I thought I would give her a large dose of ergot with opium, to

see if that would not prevent the pains. It did not succeed any better than my attempts the first time. The third time, I decided to give her immediately after confinement fifteen grains of sulphate of quinine, with the result, she said, of her having only one or two slight pains.

Dr. Wood also reports a case of poisoning by acetate of morphia, with recovery: —

Recently I was called, at eleven o'clock A. M., to attend a patient full half a mile distant, who was said to be very ill. On arriving at the house I found a large, well-built man, forty years old, who had been trying to kill himself with morphine. His face was livid, pupils contracted to a point, respiration two in a minute, pulse 60. He could be roused with much difficulty, but soon fell back into a deep stupor. I hastily learned from his mother the following history: There had been some "unpleasantness" between him and his wife, and they had not lived together for some time; he was also very much depressed because he could not obtain work; he had come home from Springfield the night before, chatted with his father and mother, also with his wife and children, and about ten o'clock retired to bed, in a room by himself. Not coming down to breakfast, at 7½ A. M. his boy, aged ten years, went to call him, and found him asleep, but roused him with much difficulty. A physician was not sent for until 10½ o'clock. I immediately administered, with much difficulty, thirty grains of sulphate of copper, and ordered large draughts of mustard-water. Returning in fifteen minutes with Dr. Martin, and finding that all efforts to make him vomit failed, the stomach was thoroughly washed out. He was breathing three times in two minutes, and his face was very livid. One thirtieth of a grain of sulphate of atropia was given subcutaneously, and Dr. Martin applied a slipper vigorously to all parts of the body. The pulse began to quicken; respiration remained the same, also stupor. The atropia was repeated every half or three quarters of an hour for five doses. Respiration increased to three in a minute; pulse 140; skin very red; pupils slightly dilated; able to arouse him so as to make him take a small quantity of strong coffee.

Stupor again increased. Respiration fell to two in three minutes. Sent for Dr. Francis, who applied the battery. The respiration in course of thirty minutes quickened to one in a minute, then slowly increased; at twelve o'clock at night it was six in a minute. Had been able to walk him about, supported by two men, for three hours. At one o'clock, respiration eight and pulse 120. Skin very red; had not perspired at all. At four o'clock he woke up very suddenly, after having been allowed to sleep for a short time, saying he was all right, but instantly fell asleep. Allowed to sleep, to be occasionally aroused. The next day he told me this story, which I have no reason to disbelieve. He went into a drug store in Springfield and bought two bottles of morphine; then he decided he would not take but one. In the cars, on his way home, he tore off the paper from the bottle, also the tin-foil or cap, opened the bottle, and tasted merely of the morphia. On going to bed that night, not knowing the amount necessary to kill himself, he took a piece the size of a large pea. He slept all night, and did not wake up until aroused

by his son. Finding he was not dead, he took all that remained in the bottle, while his son had gone down-stairs to call his mother. He tried for a long tim to prevent his mother's sending for a physician. The empty bottle was on the table by his bed. The bottle was one of Power and Wightman's.

Allowing the man's statements to be true, he must have taken nearly a full drachm at about 7½ o'clock in the morning, and nothing was done to relieve him until four hours afterwards.

This case shows the effects of atropia to quicken the respiration. But after giving five doses of one thirtieth of a grain, as the respiration again fell, it was thought advisable to use the battery. Was the peculiar redness the result of the sulphate of atropia or of the severe slapping he received? Also, did the sulphate of atropia prevent the copious sweating which usually occurs in opium poisoning? I should have stated that the patient never had been an opium eater.

THE TREATMENT OF SUNSTROKE.

The intense heat with which the country has been pretty generally visited this season has not been without its effect upon the health of the community. According to recent accounts the rate of infant mortality has been higher in the city of New York than has been known for a long period of time. The number of cases of sunstroke in this part of the country will also doubtless at the end of the season be found to be greatly in excess of that of former years. The daily papers already contain numerous accounts of individuals who have succumbed to this malady. The dangerous character of this disease, the varied opinions regarding its true nature, and the fact that most practitioners have but vague and unsettled views as to the true method of treatment render the subject in question of more than usual interest at the present time. Without attempting to give even a hasty glance at the literature of this disease, or to discuss its pathology, we could call the attention of those of our readers who are not already familiar with it to the interesting little monograph by Dr. H. C. Wood, Jr., a Boylston prize essay, published a few years since. There can be no doubt, as Dr. Wood states, that many cases of sudden severe illness have been grouped under the name of sunstroke. Prominent among these is simple exhaustion due to excessive labor in a heated atmosphere, a very different affection from true sunstroke, and characterized by symptoms sufficiently pronounced to enable a careful practitioner to recognize it without difficulty. True sunstroke, according to Dr. Wood, resembles in its nature a fever, a fever not dependent upon blood-poisoning but upon heat, an ephemeral or irritative fever. Thermic fever is the name which he accordingly applies to this disease. Taking this view of the case, and rejecting the term apoplexy, which is frequently employed by writers, a more rational method of treatment at once suggests itself. The prominent symptoms — a very hot and dry skin, with excessively high temperature as shown by the thermometer — would seem to give a clew to the remedies which are to be employed with some hope of success. The antipyretic treatment, which has so many able and energetic advocates for its efficacy in controlling fever, has here a fair field for the test of its virtues. The cold bath,

for instance, might be substituted for the ruder methods of applications of ice to the head or cold douches. The subcutaneous injection of quinine, as recommended by Surgeon Hall in *The Practitioner* for March, appears to have produced marvelous results in a case described by him. The cold douche had been employed and ice applied to the nape of the neck without effect; the heart's action was rapidly failing. Stimulants could be administered only with great difficulty, and the case was becoming desperate when quinine was administered subcutaneously. An improvement of the symptoms encouraged a further trial, and the patient made a rapid recovery. About five grains only were administered in this case. For those of our readers who have not employed quinine in this way we would state that one drop of dilute sulphuric acid and ten minims of water are necessary for the solution of one grain of quinine. The ordinary subcutaneous syringe could thus hold three grains of quinine.

Probably other remedies having a similar action, as salicylic acid, may be found to be useful, although this latter drug could not be administered with the same facility.

We point to this line of treatment as one which has not yet been thoroughly tested, and hope that those who come in contact with the disease this season will see fit to publish their experience.

MEDICAL NOTES.

— Dr. John Jeffries died at his residence on Chestnut Street on Sunday last in the eighty-first year of his age.

— William S. Dennett, M. D., has been appointed ophthalmic surgeon to the Boston Dispensary.

The Medical Register of Massachusetts is to be enlarged to include the New England States. It is to appear shortly, edited by Dr. F. H. Brown and published by H. O. Houghton & Co.

— The *Medical Times and Gazette* reports that at the London Hospital Mr. Maunder recently removed from the left bronchus of a boy, aged thirteen, a smooth oval piece of glass an inch long and forming a part of a sleeve link. It had been in the trachea eighteen days without symptoms, and about thirty hours before operation had fallen into the left bronchus. Tracheotomy was performed, the patient was inverted and shaken, but with no avail. A loop of stout silver wire was then passed six or seven inches through the wound downwards, and to the left; on the wire being withdrawn, the foreign body came with it. The patient is well.

— The *Medical Times and Gazette* of June 24, 1876, reports a terrible outbreak of cholera at Golwood, in India, a village of two hundred people on the Bombay and Baroda Railway. Over half the population died in three days. The disease appeared at noon on the 4th of June, and before daybreak the next morning there had been fifty-seven deaths. On the 8th all the survivors fled, but were refused admission by the adjacent villages. The disease displayed extreme virulence, some cases proving fatal in twenty minutes. In

these cases the ordinary cholera symptoms were absent, and the body at the first stroke of the disease became livid, convulsed, and shrunken. Medical help was some time in reaching them, there being no resident doctor in the town. Gross neglect of sanitary measures is stated to be the apparent cause, the people living in inconceivable filth. Cholera appears to be unusually prevalent in India this year, outbreaks being reported from various quarters, none, however, approaching that of Golwood in violence.

— Birmingham, England, is fortunate in the possession of a bountiful benefactress in the person of a Miss Ryland. Some time ago this lady presented to the city Cannon Hill Park, comprising some sixty acres of undulating and well-timbered land, estimated to be worth £70,000. Recently the town council desired to purchase of her forty-two acres of land situated in another part of the city. Miss Ryland refused to sell, but has given the estate to the town for a term of five hundred years, at an inconsiderable rent. The estate, says the *Medical Times and Gazette*, which is beautifully wooded, is situated two and a half miles from the centre of the town, in a quarter where the artisan class predominates. The intrinsic value of the gift is estimated at not less than £30,000.

— We cull from the *Medical Times and Gazette* the following, taken from the *Revue Thérapeutique*, in regard to the leech as a weather prophet: "An 'Old Practitioner' writes, 'I have always on my window-sill a leech in a bottle three parts filled with about a pound of water, which is changed every week in summer and every fortnight in winter. The mouth of the bottle is covered with a piece of coarse cloth. If the leech remains at the bottom of the bottle, motionless and curled on itself like a snail, there will be fine, durable, clear weather; but if it rises into the neck there will be snow or rain as long as it remains there. When it is going to be very windy the leech swims very rapidly from one side to the other, only becoming quiet on the appearance of the wind. Some days before a violent storm with rain and tempest it almost remains out of the water, and exhibits movements resembling those of a convulsive paroxysm.'"

MASSACHUSETTS GENERAL HOSPITAL.

SURGICAL CASES OF DR. CHARLES B. PORTER.

[REPORTED BY G. H. TILDEN.]

Large Housemaid's Knee; Excision; Rapid Recovery. — August 21, 1875. While moving a cask some ten years ago, C. M., a healthy man, then forty years of age, received a severe blow upon his right patella. Soon afterwards a small swelling made its appearance at the seat of injury, which for eight years grew slowly, but during the past two years has more rapidly increased in size. He now has over his right knee a tumor six inches long, five inches broad, and three and one half inches deep, resembling somewhat in shape a stumpy cucumber, its long axis being parallel to the long axis of the limb. The growth is movable, and to the feel is tense and elastic. The skin over it is smooth and glossy from stretching, and is traversed by several superficial veins. The tumor gives a sense of fluctuation, but is not translucent. There is no

pain, only inconvenience from the size and situation of the tumor. The knee-joint is perfectly sound and retains almost its normal extent of movement.

August 25th. The patient being etherized, the sac of the tumor was dissected out entire through two curved incisions, about five inches each in length, which included an elliptical shaped piece of skin on the top of the swelling. The sac was very adherent to the patella. There was but little hæmorrhage, only three ligatures being required. The flaps were brought together by numerous sutures, a hole being made in the most dependent part of the outer flap, to insure drainage and for the passage of the ligatures. The leg was placed on a well-padded ham-splint, and compression was applied over the knee by means of cotton-batting bandaged on. This was the only dressing.

The patient had hardly any pain or constitutional disturbance, so the wound was not exposed till the 27th. It was looking finely, there being not a particle of inflammation. A narrow strip of simple cerate was applied to the line of incision, and the cotton-batting was reapplied.

On the 28th, one half the stitches (every other one) were removed and their places supplied by narrow strips of adhesive plaster.

All the remaining stitches were removed on the 29th, the wound looking as well as possible. The ligatures all came away by October 30th, and the patient was practically well. The line of incision had joined perfectly by first intention, there having been not a drop of pus formed since the operation. There only remained a small granulating spot, the size of a nickel five-cent piece, which corresponded to the opening which had been made in the outer flap. This rapidly healed. At no time was there anything like effusion into or trouble with the knee-joint, but for prudence' sake the patient was kept quiet in bed till September 8th, when he was allowed to get up. He was discharged, well, September 10th.

Typical Abscess of Head of Tibia; Trephining; Recovery. — October 2, 1875. About five months before entrance, J. W., fifteen years of age, was kicked by a cow on the right leg, just below the knee. A month afterwards he began to suffer from pain in the inner and anterior portion of the same leg, just below the knee. The pain was aggravated at night and by use of the limb, and its locality was marked by swelling and tenderness. The pain and the swelling and tenderness were synchronously intermittent, appearing and then disappearing at varying intervals of time. On entrance he was able to walk, but had in a spot which overlay the inner tuberosity of the right tibia a circumscribed circular swelling, about the size of a large watch crystal, and but slightly elevated above the surrounding skin. This spot was tender on pressure, slightly reddened, and œdematous. The knee-joint was normal in size and contour, being apparently uninvolved. The leg was placed on a ham-splint, and a blister was applied to the locality of pain and swelling. For a little over two weeks nothing was done more than keeping the patient in bed with the leg on a splint. One or two blisters were applied. The pain increased gradually, with exacerbations and remissions. The circumscribed swelling and tenderness increased with the pain. Constitutional symptoms began soon to declare themselves, and the patient became feverish and had several marked but irregular chills. The pain finally became so severe as to amount to agony, espe-

cially at night, and subcutaneous injections of morphine were required to keep the patient in any sort of comfort.

Operation, October 21st. The patient was etherized and a crucial incision about two inches long each way was made through the swollen and œdematous tissues down to the tibia. The periosteum was thickened to one fourth of an inch, reddened and inflamed. The periosteum being scraped from the surface of the bone a button of bone, three fourths of an inch in diameter was drilled out of the head of the tibia by means of a trephine. On the removal of this button of bone, as much as three or four drachms of pure pus welled up through the opening and escaped. A sponge covered with a compress was stuffed into the wound to check oozing, and the leg was replaced on a ham-splint. In the afternoon the sponge was removed and the wound lightly dressed with carbolic acid and water, one part in sixty.

The next day the patient expressed himself as entirely relieved from pain. This perfect exemption from pain was permanent, and his febrile symptoms also rapidly diminished.

The splint was removed on the 24th, and the wound healed up slowly but steadily, the patient being discharged, well, December 22d.

Fracture of the Ribs; Complete Unilateral Emphysema; Delirium Tremens; Recovery. — September 8, 1875, H. E., a robust man, thirty-eight years of age, while walking on the track was struck on the right arm by the step of a locomotive and thrown some distance. He was brought to the hospital one hour after the occurrence of the accident, in a somewhat collapsed state. His most evident symptom was distress in breathing. There was marked emphysema of the right side of the back, extending from the top of the scapula to the false ribs and round toward the front over the right side of the chest. Pressure upon the ribs gave the patient severe pain, which was referred to the back just below the right scapula, and to the side of the chest just below the right axilla. The infiltration of the tissues with air, however, was so extensive that no crepitus due to fracture of the ribs could be felt. The great pain on inspiration caused the breathing to be rapid and superficial. There was no cough nor hæmoptysis. On the outer side of the right arm there was a small contused wound, where the blow from the locomotive had been received, and there was also a small lacerated scalp wound. Evidence of fracture of any other bones than the ribs was wanting, and the man was perfectly rational, there being no brain symptoms whatever.

The right side of the chest was encased in a jacket of overlapping strips of adhesive plaster, extending from the spine to the sternum and from the axilla to just below the last ribs. The wounds of the head and arm were dressed with simple carbolic acid and water dressing, one part to sixty.

Brandy was given, one ounce every four hours, besides milk and beef-tea at short intervals.

September 10th. Decided reaction has set in. Patient can lie only on the uninjured side, and his distress in breathing has increased. The emphysema has rapidly spread, and now reaches from the right temple, the eye being completely closed, down over the right cheek, the neck, shoulder, back, and flanks, into the penis and scrotum, which latter is as big as a good-sized cocoa-nut and almost as tense as a toy balloon.

September 11th. The emphysema is still spreading, and has gone into the abdominal walls as far as the middle line, and down over the nates, thigh, and leg as far as the ankle. The infiltration of the tissues with air was now at its maximum, and the patient presented a very curious, one sided, bloated appearance. There was hardly a spot on the right of the middle line of the body, with the exception of the arm, which did not give tympanitic resonance on percussion, and to the touch the characteristic crepitant feel of emphysema.

During the next two days the patient had a violent attack of delirium tremens, which only succumbed to the free use of potass. bromide and chloral hydrate. The emphysema began to diminish on the 12th, first departing from the penis and scrotum, and gradually leaving the extremities and then the trunk. With the exception of the attack of delirium tremens the patient's progress toward recovery was rapid and uniform, the emphysema and most of the dyspnœa having disappeared by the 16th. The patient was up and dressed by the 24th, and was discharged, well, October 4th, three weeks and five days from date of injury. The jacket of adhesive plaster was renewed as occasion required. At no time was there any cough or hæmoptysis.

LETTER FROM NEW YORK.

Messrs. Editors, — Within the past two weeks important changes that have given rise to considerable bad feeling have been made in the faculty of the University Medical College. In order to understand the affair better, it should be stated that the governing board of the faculty consists of the professors of anatomy, practice of medicine, physiology, materia medica, surgery, obstetrics, and chemistry. At a recent meeting of this board, from which the professors of anatomy and obstetrics were absent, one being out of town and the other sick, the following changes were made: The dissecting-room was taken away from Dr. Darling, Professor of Anatomy, and given to Dr. F. D. Weisse, who was appointed Professor of Practical and Surgical Anatomy. Dr. Darling has been connected with the college since 1851, and has been a member of the governing faculty since 1866. He has always had charge of the dissecting-room, and has spent much time in giving instruction to the students there.

Dr. J. W. Wright was appointed to deliver a course of lectures on obstetrics, thus placing him over Dr. W. R. Gillette, adjunct professor of obstetrics, who has acted as Dr. Budd's assistant since 1871, and for the past two years has done much of Dr. Budd's work with perfect satisfaction to all.

Dr. Erskine Mason, who entered the faculty in 1870 as adjunct professor of surgery, and was made professor of clinical surgery last year, has been virtually dropped from the list of instructors. He is deprived of all work in the college, and is simply asked to give clinical lectures in connection with his position as surgeon to Bellevue Hospital.

Some years ago a clinic for diseases of women was established, which was in charge of the late Dr. Kammerer, with Dr. Robert Watts as his assistant. At the time of his death, and until last fall, Dr. Watts had charge of the

clinic, but at the beginning of the winter course it was abolished on account of some feeling as to who should have charge of it, and Dr. Watts was made a lecturer on diseases of women, with the distinct understanding that if ever the clinic should be reëstablished he should have charge of it, in connection with Dr. Gillette, and now without any explanation it is reëstablished, and Dr. Pallen is placed in charge of it.

Immediately on the above changes being known, Professors Budd, Mason, and Gillette, and Dr. Watts sent in their resignations. Dr. Budd resigned because, in his absence and without his knowledge, the faculty had appointed a lecturer on obstetrics of whom he knew nothing, thus virtually displacing Dr. Gillette, who had worked with him for five years, and had given perfect satisfaction to himself and the students.

A year or more ago, on account of ill health, Dr. Budd wished to resign his position at the college, and it was only at the urgent solicitation of the faculty that he consented to remain.

Neither Dr. Mason, Dr. Gillette, nor Dr. Watts could continue his connection with the college with any self-respect in the face of this action of the board. The resignation of these gentlemen was unexpected to that portion of the governing board which has been instrumental in making the changes, and it leaves them in a rather unpleasant position. They can assign no reason for their action, since all these gentlemen were considered good instructors and were popular with the students. The college is not in a position to weaken itself, either by a change in its faculty or by bringing upon itself the discredit of unjustly treating those who have worked for its interest. Two of the gentlemen who have resigned, Dr. Mason and Dr. Budd, hold positions in Bellevue Hospital, and in their loss the school loses the use of their wards for the purposes of clinical instruction.

I understand that Dr. Wright will give the course of lectures next winter on obstetrics. He graduated in 1867, and has given a summer course of lectures on surgical dressings. Dr. R. A. Witthaus, a graduate of the class of 1875, has been appointed adjunct professor of physiology, and Dr. J. W. S. Gouley has been appointed professor of genito-urinary diseases. The virtual dismissal of Dr. Mason was made in the interest of Dr. Darley, professor of surgery, who wished full control of the instruction in surgery at the college.

Since writing the above I hear that Dr. Budd has consented to allow his name to be retained on the catalogue as emeritus professor of obstetrics. The college is reported to be greatly in debt, the new building is heavily mortgaged, and the old college building is still on their hands; they have been unable to sell it or to put it to any use. The university, in common with the other medical schools in New York, labors under the disadvantage of having its professorships unendowed. Perhaps this is a greater burden to the university than to the other colleges, as the building is owned to a great extent by a portion of the faculty. How far the financial question has been an element in bringing about the above-mentioned changes it is impossible to say. One thing is certain, that the faculty have not strengthened themselves, as far as the established reputation of the instructors is concerned, by the changes, if we except Dr. Gouley, who is an instructor and surgeon of recognized ability.

The *New York Medical Record* has been lately criticising the system of a short-term course in certain medical schools, for which it has been taken up by a writer in the *New York Times*, who seems to have come out of the discussion second-best. The writer in the *Times* labored under the mistake that the *Record* was working in the interest of the New York schools, and that the purpose of the writer was to bring into discredit all small medical colleges. The evident sensitiveness of the writer in the *Times* on this subject suggests the question whether an inquiry into the way of graduating students at some other colleges would show a strict compliance with the law in regard to the length of time devoted to study.

At a recent meeting of the board of government of the New York Hospital, Dr. Robert F. Weir was appointed one of the attending surgeons to the hospital, in the place of the late Dr. Krackowizer. Dr. Weir has had an extensive hospital experience; he was for ten years a surgeon to St. Luke's Hospital, and at present holds a similar position at the Roosevelt Hospital. The Floating Hospital of St. John's Guild has commenced its excursions for the season.

In a recent copy of the *New York Times* there appeared an account of a case of injury to the skull of a child, in which the operation of trephining had been performed. The doctor had given unusual facilities to the reporter for seeing the case and preparing the article, and the operator's name and address were not omitted from the published account. Is it not about time that this parading one's name in the papers was put a stop to?

COMPARATIVE MORTALITY-RATES FOR THE WEEK ENDING JULY 8, 1876.

	Estimated Population.	Total Mortality for the Week.	Annual Death-Rate per 1000 during Week.
New York	1,060,000	858	42
Philadelphia	825,000	618	39
Brooklyn	506,223	382	39
Chicago	420,000	226	28
Boston	375,000	162	23
Providence	100,700	41	21
Worcester	50,000	19	20
Lowell	50,000	22	23
Cambridge	48,000	17	18
Fall River	45,000	37	43
Lawrence	35,000	25	37
Lynn	33,000	9	15
Springfield	31,000	9	15
Salem	26,000		

Normal Death-Rate, 17 per 1000.

THE BOYLSTON MEDICAL PRIZE COMMITTEE take pleasure in being permitted to announce that Francis H. Brown, M. D., of Boston, is the author of a dissertation on Civil Hospital Construction, which was honorably mentioned and recommended for publication, in their advertisement of the present year. R. M. HODGES, *Secretary.*

BOSTON, *July* 17, 1876.